Chapter 8
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8 Data Gaps and Future Work

Introduction

This Assessment Report has been prepared using the best data and knowledge available at the time the technical studies were completed, and where possible, at the time of publication. However, completing scientific assessment on the quality and quantity of water undoubtedly raises a number of questions and uncertainties regarding the methodologies used (as discussed in Chapter 6), availability of data, reliability of data and overall outcome. As new information arises, either from increased or continuous monitoring, improved models, or a change in methodology, the results from this report will have to be updated to reflect the additional information.

This chapter provides information about known data gaps and knowledge limitations, as follows:

Data Gaps for Inclusion in an Updated Assessment Report

This data is required in the Assessment Report but is not currently available. It is important that these data gaps be filled in a timely fashion so that the information is available to the Source Protection Committee for use in developing the Source Protection Plan. These data gaps will be included in an updated Assessment Report to be submitted to the province in 2011.

Knowledge Limitations for Continuous Improvement of Technical Studies

The Assessment Report has been prepared using best data and knowledge available at the time the technical studies were completed. Whenever possible, it is important to obtain better data and knowledge to improve the accuracy of the technical studies. Any improved data and knowledge will be incorporated into future Assessment Reports.

8.1 Data Gaps for Inclusion in an Updated Assessment Report

The following known data gaps should be included in an updated Assessment Report submitted to the MOE in mid 2011.

8.1.1 Future Lanark Water Supply

As noted in Chapter 5, the Township of Lanark Highlands is currently seeking construction funding and working on the design of a new municipal groundwater-based drinking water system for the Village of Lanark in Lanark County. This planned system has been studied in accordance with the provincial environmental assessment process and is included in the Approved Terms of Reference for the Mississippi Valley Source Protection Area.

The following work plan has been developed for the Future Lanark Water Supply.

Task	Planned Completion Date
Delineation of wellhead protection areas, including vulnerability scoring	Spring 2011
Threats and Issues Evaluation, including managed lands and livestock density calculations	

Table 8-i. Workplan Tasks for Future Lanark Water Supply.

8.2 Update of Significant Threat Counts Based on New Information

Site visits were not carried out to confirm significant threats circumstances on each property. Instead, a conservative approach was generally taken for the identification of significant threats in accordance with the provincial threats tables. 'Significant Threats Notification' letters were sent out in early October 2010 to all property owners who have been identified as a potential significant threat. MRSPR staff have since received, and continue to receive, responses from a large number of property owners about specific information with regard to significant threats. An updated significant threats count will be included in the 2011 updated Assessment Report as it will be used for notification purposes during the preparation of the source protection plan.

8.3 Identification of Knowledge Limitations for Continuous Improvement of Technical Studies

Some knowledge limitations are very minor and were filled with conservative assumptions. Others were more significant and may lead to further study and collection of more data. The following key limitations were identified during the completion of the background technical studies. Where available, a more detailed list of knowledge limitations is provided in each technical report.

8.3.1 Knowledge Limitations for Chapter 2 – The Mississippi-Rideau Source Protection Region

Based on a review of the Watershed Characterization Report (see Appendix A-1), the following knowledge limitations were identified that if filled, would result in improved future technical studies.

Watershed Description

- Surficial geology mapping for a portion of Frontenac County and Lennox & Addington County is not available
- A database of Federal lands locations is not available
- Limited number of stream flow gauges in both the Mississippi Valley and Rideau Valley watersheds

- Limited coverage for shoreline conditions classification
- Limitations were identified with the provincial water well records (further discussed in Section 8.2.3)
- No active climate change stations are located at the north end of the Mississippi Watershed
- Limited population statistics to calculate the population of development areas, private services areas, and seasonal residents
- Digital Official Plan mapping for Addington Highlands, North Frontenac and South Frontenac is not available
- Limitations were identified with the Permit To Take Water (PTTW) provincial database (further discussed in Section 8.2.2)

Surface Water Quality

- Lack of surface water quality monitoring stations/programs in close proximity upstream of the municipal surface water intakes

Groundwater Quality

- Lack of groundwater quality monitoring locations/programs beyond the municipal groundwater systems

8.3.2 Knowledge Limitations for Chapter 3 – Water Budget

Based on a review of the water budget technical studies (see Appendix A-1), the following knowledge limitations were identified that if filled, would result in improved future technical studies.

- Lack of actual water takings from Permit to Take Water (PTTW) database. For example, the current PTTW database only includes permitted (maximum) water taking data, and not actual takings
- Lack of water taking data from private wells, agricultural water users, and other non-permitted water users
- Limited number of stream flow gauges in both the Mississippi Valley and Rideau Valley watersheds, especially for the Tay River subwatershed and the Mississippi River downstream of Appleton
- Lack of information about groundwater recharge and discharge, and evapotranspiration
- Water discharged via sewers was reported to be significantly higher than water consumed via potable water systems. This issue warrants additional research as, over time, sewer drainage of groundwater resources can become a water budget demand that is significant in those areas facing water supply challenges.

8.3.3 Knowledge Limitations for Chapter 5 - Groundwater Sources

Based on a review of the groundwater technical studies (see Appendix A-1), the following knowledge limitations were identified that if filled, would result in improved future technical studies.

Groundwater Studies

Highly Vulnerable Aquifers, Significant Groundwater Recharge Areas, and Wellhead Protection Areas

- limitations were identified with the provincial water well records. For example, better static water levels, well locations and geologic descriptions would greatly improve the understanding of sub-surface conditions and calibration of groundwater models
- lack of detailed information about aquifer properties such as hydraulic conductivity, porosity, transmissivity, storativity, and water levels in the aquifer
- limited amount of information is known about the Nepean Aquifer system
- lack of detailed information is available on the overburden conditions in Carp and Kemptville
- limited amount of information is known about bedrock faults
- lack of information about groundwater recharge and discharge, and evapotranspiration
- the characterization of groundwater movement in fractured bedrock is not known
- lack of information about the location of abandoned wells

Managed Land and Livestock Density

- limited amount of livestock density data available at local and regional scales

Threats and Issues

- limited documentation available to confirm conditions. For example, the provincial spills database may indicate that a spill has occurred on a property, but there is no additional information with regard to the status of the spill.

8.3.4 Knowledge Limitations for Chapter 6 - Surface Water Sources

Based on a review of the surface water technical studies (see Appendix A-1), the following knowledge limitations were identified that if filled, would result in improved future technical studies.

Ottawa River IPZ-2

Though some preliminary work has been done in delineating the IPZ-2 for Britannia and Lemieux Island water intakes on the Quebec side of the Ottawa River, further information is needed.

Inland Rivers Surface Water Studies for Intake Protection Zones

- Limited bathymetric (river bottom) information is available
- Limited raw water quality data available upstream of the intakes
- Additional review and ‘ground-truthing’ the transport pathways within IPZ-2 would be beneficial, especially on private land
- Limited information is available for transport pathways in IPZ-3. For example, extent of drains, trenches, tile drains (also for IPZ-2), and karst features must be determined.
- Incomplete hydrologic and hydraulic information upstream and in the vicinity of each intake

Managed Land and Livestock Density

- Limited amount of livestock density data available at local and regional scales.

Threats and Issues

- Limited documentation available to confirm conditions. For example, the provincial spills database may indicate that a spill has occurred on a property, but there is no additional information with regard to the status of the spill.

8.3.5 Knowledge Limitations for Chapter 7 – Climate Change

Based on a review of the climate change technical studies (see Appendix A-1), the following knowledge limitations were identified that if filled, would result in improved future technical studies.

- Flow projection information for Rideau watershed, similar to the Mississippi data
- Development of uncertainty analysis for available local level precipitation and temperature projections
- Effects of climate change on water budget (precipitation, ET) for Rideau watershed, similar to Mississippi data